UNITED STATES GEOLOGICAL SURVEY GRYBECK AND NELSON-MINERAL DEPOSIT MAP DEPARTMENT OF THE INTERIOR INTRODUCTION REFERENCES CITED CORRELATION OF MAP UNITS This report is a summary of information on the mineral Anderson, Eskil, 1947, Mineral occurrences other than gold UNCONSOLIDATED DEPOSITS deposits of the Survey Pass quadrangle, Alaska. As used in this deposits in northwestern Alaska: Alaska Department Mines report, mineral deposits include mines, prospects, and occur-Pamphlet 5-R, 48 p. rences of minerals or elements of possible or actual mineral resource potential. It is one of a series of reports that pro-Garland, R. E., Eakins, G. R., and Trible, T. C., 1975a, vide an estimate of the mineral resources of the quadrangle Geochemical analysis of rock and stream-sediment samples under the Alaska Mineral Resource Assessment Program (AMRAP) from the Survey Pass C-4 quadrangle, Alaska: Alaska The other reports of this folio are in the MF-1176 map series of Division Geological and Geophysical Surveys Open-File MAINLY METAMORPHOSED the U.S. Geological Survey and are described in U.S. Geological Survey Circular 835. UNMETAMORPHOSED TO LOW-GRADE MAFIC IGNEOUS ROCKS METAMORPHIC ROCKS Garland, R. E., Eakins, G. R., and Trible, T. C., 1975b, OF UNCERTAIN AGE IGNEOUS ROCKS METAMORPHOSED SEDIMENTARY ROCKS OF UNCERTAIN AGE SOURCES OF INFORMATION Geochemical analysis of stream-sediment samples from the Survey Pass C-5 quadrangle, Alaska: Alaska Division The data in this report are based on published reports, Geological and Geophysical Surveys Open-File Report 64, discussions with geologists from private industry known to be CRETACEOUS active in the area or knowledgeable about it, Federal and State claim records, and fieldwork during the summers of 1977 and 1978. Garland, R. E., Eakins, G. R., Trible, T. C., and McClintock, W. W., 1975a, Geochemical analysis of rock and stream-Published reports on the mineral deposits are few, and until sediment samples from the Survey Pass A-3 quadrangle, recently the quadrangle has received relatively little attention Alaska: Alaska Division Geological and Geophysical from geologists or prospectors looking for metallic minerals. Surveys Open-File Report 66, 2 p. Within the last decade, however, the discovery of large volcano-Cu, Pb, Zn, Ag. Sb Garland, R. E., Eakins, G. R., Trible, T. C., and McClintock, genic, massive-sulfide copper-zinc deposits in the Ambler River quadrangle to the west has prompted much industry work in the W. W., 1975b. Geochemical analysis of rock and streamcopper belt" in the southwest part of the Survey Pass quadrangle. sediment samples, Survey Pass A-4, A-5, A-6, B-5, and Most of the potentially metalliferous units in the belt have been B-6 quadrangles, Alaska: Alaska Division Geological and staked, and the area is currently active. Almost all of the rest Geophysical Surveys Open-File Report 67, 2 p. of the quadrangle has been closed to prospecting and development Dhfs since 1971 under provisions of section (d)(2) of the Alaska Grybeck, D. J., McDanal, S. K., Cooley, E. F., and O'Leary, Native Claims Settlement Act; work by industry and private R. M., 1981, Map of anomalous rock samples and histograms individuals prior to that time was limited. of trace metals in rocks of the Survey Pass quadrangle, Brooks Range, Alaska: U.S. Geological Survey Miscel-Our 1977 and 1978 work under the Survey Pass AMRAP program laneous Field Studies Map MF-1176-E, scale 1:250,000. was at reconnaissance scale. Most of our effort was spent on Pzclq Pzsgn geologic mapping during which a number of previously unknown Kline, J. T., 1976, Lode claim groups of the southwestern mineralized occurrences were found. In general, our work was Brooks Range copper belt, Ambler River and Survey Pass neither detailed nor exhaustive although those involved normally guadrangles. Alaska (filed prior to January 1976): Alaska Division Geological and Geophysical Surveys, DEVONIAN AND SILURIAN spent a reasonable amount of time looking for obvious extensions to newly discovered deposits. A considerable amount of time was Mines and Geology Bulletin 99. spent in examining previously known mineral deposits, in tracing Marrs, C. D., 1978, Geology of the Sun massive sulfide deposit, Ambler district, Alaska (abs.): Northwest Mining drainage geochemical anomalies that were discovered during the first season's reconnaissance, and in investigating likely geologic environments favorable for the formation of mineral Association, 84th Annual Convention, Spokane, Washington deposits. The results of this work are included in table 1. More than 1,500 rock samples were collected and analyzed by Mendenhall, W. C., 1902, Reconnaissance from Fort Hamlin to semiquantitative spectrographic and atomic absorption methods to Kotzebue Sound, Alaska: U.S. Geological Survey Profesestablish geochemical background and to sample mineralized areas. Those data will be published later separately, but the data per-Nelson, S. W., and Grybeck, Donald, 1980, Geologic map of the Survey Pass quadrangle, Brooks Range, Alaska: U.S. taining to the mineral deposits are summarized in table 1 of this report. Many of the mineral deposits listed in this report are Geological Survey Miscellaneous Field Studies Map MF-1176-A, occurrences based on analytical data rather than on the observed presence of ore minerals. The criterion for defining an occurrence on analytical data alone is that the metal values are so Schrader, F. C., 1904, A reconnaissance in northern Alaska high that they clearly indicate a mineral resource or are sug-DESCRIPTION OF MAP UNITS across the Rocky Mountains, along Koyukuk, John, Anaktuvuk, gestive of a deposit. A more detailed study of the metal values and Colville Rivers and the Arctic coast to Cape Lisburne, and geochemical threshold levels of the rocks analyzed in this Metamorphic Rocks of Uncertain Age Unconsolidated Deposits in 1901, <u>with notes by W. J. Peters: U.S. Geological Survey Professional Paper 20, 139 p.</u> study is given in Grybeck and others (1981). MDcp CALCAREOUS PHYLLITE--Black calcareous phyllite Qu SURFICIAL DEPOSITS, UNDIVIDED There are no occurrences of coal, natural gas, or petroleum with thin dark-gray limestone lenses Sicherman, H. A., Russell, R. H., and Fikkan, P. R., 1976, The in the quadrangle. The essentially unlimited numbers of sand geology and mineralization of the Ambler district, Alaska: and gravel occurrences are not tabulated here because of the Pzs LOW-GRADE SCHIST--Chlorotoid-bearing quartz-Unmetamorphosed to Low-Grade Bear Creek Mining Co., Spokane, Washington, 22 p. muscovite schist, calcareous quartz-albiteoverriding effect that logistics and marketability have on their Metamorphosed Sedimentary Rocks definition as economic deposits. Similarly untabulated are the Smith, P. S., 1913, The Noatak-Kobuk region, Alaska: U.S. many prominent, massive carbonate rocks (most are in the Skajit UNDIVIDED CONGLOMERATE -- Quartz-pebble and igneouslimestone beds. Schist locally contains Geological Survey Bulletin 536, 160 p. Limestone) that might have value as industrial minerals. pebble conglomerate; some interbedded volcanic Smith, P. S., and Mertie, J. B., Jr., 1930, Geology and mineral resources of northwestern Alaska: U.S. Geological Survey Pzclq CHLORITIC QUARTZITE--Chlorite quartzite and TR Ps SHUBLIK AND SIKSIKPUK FORMATIONS (Triassic and chloritic quartz schist Bulletin 815, 351 p. Permian) -- Pink-weatherimg limestone of Shublik Pzsgn LOW- TO MEDIUM-GRADE SCHIST AND GNEISS--Inter-Formation (Triassic) and black slate and chert Smith, T. E., Proffett, J. M., Heatwole, D. A., and Seklemian, R., layered quartz-muscovite schists and orangeof Siksikpuk Formation (Permian) 1977, Geologic setting of base-metal massive sulfide weathering marble. Medium-grade schist and deposits, Ambler district, northwest Alaska (abs.): Alaska ENDICOTT GROUP (Mississippian and Devonian) -- In map paragneiss with garnet, biotite, and Geological Society Symposium, Program and Abstracts, amphibole near plutons area includes: KAYAK SHALE AND KEKIKTUK CONGLOMERATE (Lower Smith, T. E., Webster, G. D., Heatwole, D. A., Proffett, J. M., Mississippian) -- As mapped, unit includes TABULATION OF DATA Kelsey, G., and Glavinovich, P. S., 1978, Evidence for Contact--Dashed where approximately located; mid-Paleozoic depositional age of volcanogenic basea few outcrops of limestone in lower (?) dotted where concealed The table below summarizes the data on the mineral deposits of the metal massive sulfide occurrences and enclosing strata, part of Lisburne Group quadrangle under the following headings: Ambler district, northwest Alaska (abs.): Geological Society of America, Abstracts with Program, v. 10, p. 148. Ag, Cu, Pb, Sb, Zn KANAYUT CONGLOMERATE (Upper Devonian) -- Non-Refers to the localities shown on the map. U.S. Bureau of Mines and U.S. Geological Survey, 1976, Principles Names of mines, prospects or occurrences of the mineral resource classification system of the U.S. and shale. Prominent, resistant layers of Fault--Dashed where approximately located or are given if such are used in reports or Bureau of Mines and U.S. Geological Survey: U.S. Geological black-lichen-covered light-gray quartzite. inferred; dotted where concealed; queried Survey Bulletin 1450-A, p. Al-A5. if they are commonly used in referring Rare conglomerate where uncertain to the deposit. Where convenient, a deposit without a proper name is desig-HUNT FORK SHALE (Upper Devonian) -- Dark-gray nated (in parentheses) by reference to phyllite with minor quartz mudstone and a nearby geographic feature. sandstone. Upper part includes: Wacke sandstone member -- thick monotonous unit Thrust fault--Dashed where approximately All deposits are located by township and of interbedded rusty-weathering feldrange and by a quadrangle grid coordinate located or inferred; dotted where conand shale. Locally includes thin layers cealed; queried where uncertain. Sawteeth grid coordinates is the distance in inches of reddish-grav fossiliferous limestone on upper plate along a perpendicular from the west margin and calcareous sandstone. of the map to the deposit; the second number is the distance in inches from the GRAY PHYLLITE--Mainly gray, calcareous phyllite and southwest corner of the map along its west muscovite schist: contains limestone beds up to margin to the perpendicular. 20 m thick. Locally consists of lenses of quartz-MINERAL DEPOSIT SYMBOLS Ow, Zn, Sn, Be, Bi pebble conglomerate interbedded with orangeommodities of The commodities are listed that are or may weathering, fossiliferous limestone, black Mineral deposit -- showing type and size, constitute mineral resources in each siliceous phyllite, or micaceous schist map number, and significant elements deposit. The definition of these commodities is based on present knowledge, SKAJIT LIMESTONE (Devonian and Silurian) -- Massive white to light-gray granoblastic marble and Pervasively mineralized area--showing tabulation of elements or minerals of orange-weathering dolomitic marble. Some intermap number and significant elements potential value as resources does not layered chlorite schist or commodities imply that all will be equally valuable Some are of minor significance; in other words, they would probably constitute Metamorphosed Igneous Rocks byproducts if the deposit were mined. However, the data are so limited, GNEISSIC GRANITE--Medium- to coarse-grained biotite-Gold placer especially for the occurrences, that the muscovite orthogneiss ranging in composition from order of significance of the various granite to alkali-feldspar granite. Commonly well-Stratiform volcanogenic Cu-Zn-Pb-Ag developed augens; locally cataclastically deformed METAFELSITE--Mainly quartz-albite-feldspar schist; Polymetallic contact metamorphic 0 = Occurrence locally porphyroblastic muscovite-biotite-quartz-= Prospect albite-feldspar rocks that retain igneous textures = Prospect with activity since 1960 Deposits other than those character-M = Mine; but those few mines in the GRANITIC SCHIST--Medium-grained porphyroblastic gray ized above or of unknown type quadrangle are placers which have biotite-quartz-feldspar schist produced only minor gold. All or Approximate outline of lode claims most might be better considered as filed prior to January 1976 along Au, Ag, Cu, Pb, Zn Mainly Metamorphosed Mafic the Brooks Range copper belt. Igneous Rocks of Uncertain Age Shown as an indication of the extent A summary of the geology of the deposit, of volcanogenic, massive sulfide Cu-Zn-Pb-Ag mineralization; bound-MAFIC VOLCANIC ROCKS, PHYLLITE, SANDSTONE, AND CHERTwith the extent and grade of the mineral-Consists mainly of interbeds and fault slivers of ization to the extent possible. Includes aries should not be considered Devonian(?) to Jurassic pillow basalt, greenstone, a short statement of the geologic or definitive since 1976. Boundaries and diabase, gray phyllite, wacke sandstone, minor exploration work on the deposit through from a compilation by the Alaska 1978 and figures for reserves or idenriassic radiolarian chert, Mississippian radio-Division of Geological and Geolarian chert, and thin beds of Paleozoic limestone. tified resources in the few cases where physical Surveys based on claim Weakly metamorphosed to unmetamorphosed such data are available. The resource records (Kline, 1976) erminology follows that agreed upon by MAFIC VOLCANIC AND INTRUSIVE ROCKS--Basalt, greenthe U.S. Bureau of Mines and the U.S. 1 The distinction between large and small deposits is substone, and altered gabbro. Unmetamorphosed to Geological Survey (1976). jective. Small deposits are those of limited size or slightly metamorphosed apparently limited size for lack of knowledge about them Includes all original references to the Large deposits are those of substantial size with notable deposit in the literature. Reference to resources or reserves or those that have been extensively mineral deposits found during this study includes the field number (in parentheses of the samples. The significant analytical data for these samples is included in the brief description of the deposit; complete analytical data will be published Geology generalized by D.J.Grybeck SCALE 1:250 000 Base by U. S. Geological Survey, 1956 and S.W.Nelson, 1980. Detailed geologic map published as part of this folio (Nelson and Grybeck, 1980) CONTOUR INTERVAL 200 FEET DATUM IS MEAN SEA LEVEL O Samples of quartz veins and Mineralized area near contact This study Abundant skarn near contact of This study T. 19 N., T. 24 N., T. 24 N., Ag, Cu of granite with chlorite schists granite and carbonates: selected (78AMH123). in 1974. Type of mineralization Div. of gossans in limestone and of possible, not known but probably on volcano- Geological samples of float contain as much (11.0, 5.4)phyllite just above contact (6.8, 8.1)probable or as 200 ppm Be, and 100 ppm Bi, and with granite show sparse magneduring geologic mapping. Minor genic Cu-Zn mineralization. copper staining prominent in tite and chalcopyrite; one grab potential category sample contained 1.5 ppm Ag. several cliffs in the area; grab T. 22 N., Cu Mineralized zone about 3 m thick This study samples that contain fluorite and Such contact metamorphic mineralization probably common in vicinity records. chalcopyrite also contain up to in calc-silicate rocks consists This study Abundant float of white brec-T. 29 N., (10.3, 4.6)of white quartz with disseminated but is apparently erratic and small. 3 ppm Ag, 300 ppm Bi, and 100 ppm ciated quartz in headwaters R. 16 E. (4.8, 15.3) halcopyrite and tourmaline inter-T. 20 N., Grab sample of black horn-This study of creek commonly contains layered with limonitic gossan. felsed shale taken a few (78ADG014) O Grab sample of an orangedisseminated galena and as much T. 24 N., meters from a small stock weathering micaceous quartz Selected samples of iron-stained This study Grab samples of black phyllite This study of foliated granite contains (7.2, 8.5)schist with disseminated pyrschist and skarn float in creek Source of mineralization not about 100 m from an altered 200 ppm Mo. rhotite collected during geolo-(12.4, 8.2)probably derived from granite found; area largely covered b granite contain as much as 200 talus and tundra. Similar to gic mapping contains 100 ppm Mo. contact to south contained up t 5000 ppm As, 20 ppm Bi, and 1000 ppm Be, 50 ppm Bi, 5000 ppm Sn, Selected sample contained mineralization seen at map nos. Float samples collected in talus This study 3 ppm Au. Eakins, 2, 4, and 5. Trible and Several tactite bodies up to 700 U.S. Bureau of 51 --Several samples of marble, calc- This study examples of magnetite skarns (Arrigetch T. 28 N., R. 16 E. Creek traversed for about a mile This study (1975b). silicate rocks and gneiss granite (77ADB235). m long by 70 m thick at and hornblende-calcite skarns in search for mineralization. (12.8 &13.2 Sparse white brecciated quartz probably derived from ridge (4.6, 14.9)Garland, tains lenses and pods of magneppm Sn, 20 ppm Mo, and 30 ppm Bi. O Grab sample contained to east near contact of the float in creek contains rare tite with minor disseminated 1.5 ppm Au. sphalerite and galena with as chalcopyrite, sphalerite and R. 22 E. (13.6, 5.9) developed at contact of granite McClintock tungsten minerals. Briefly chalcopyrite, stibnite, and with calcareous rocks. Epidote-(1975b). galena. Grab samples contain up Disseminated to massive chalco- This study T. 28 N., R. 16 E. garnet, magnetite-quartzto 70 ppm Be, 700 ppm Bi, and pyrite occurs in at least one Contact area of granite briefly This study The Sun deposit is stratahornblende skarns contain numerous R. 17&18 E. examined. Heterogeneous contact (78AMH110). about 0.5 mthick that cuts deposit associated with metaerratically distributed metamorphic rocks at granite con-O Several samples of fluorite This study across gray shaly argillite F, Ag sphalerite and fluorite. rhyolite piles in a low-grade metamorphic sequence of Sparse float in creek of white Analyses of numerous grab rock, quartz-epidote ribbon brecciated quartz commonly conup to 2 ppm Ag. Area briefly samples show as much as 7000 ppm As skarns, epidote garnet and tains minor disseminated galena, calc-mica schists, marble, sphalerite-epidote skarns. sphalerite, and chalcopyrite. 200 ppm Bi, and 500-1000 ppm Zn. Selected samples contain up to chlorite schist and quartzite. Smith and Five-meter-thick quartz-150 ppm Ag, 1000 ppm Bi, and Resource figures have not been others carbonate-fluorite vein in published, but they are subhornfelsed calcareous rocks stantial. D. A. Heatwole just above granite contact traverses along creeks in area cates that the Sn is not present as A brief search along contact contains 100 ppm Sn. Briefly an oxide or sulfide. Occurrence indicates that the Sun deposit of granite with phyllite briefly examined to determine has a gross metal value of float scattered over the area, but extent and nature of mineralization. about \$1.6 billion (at March, Ore minerals occur in a roof no substantial concentrations 1979 metal prices) and the prominent consists of major magpendant of Devonian schist Similar to map no. 54; selected This study deposit is still open on two netite with copper staining. float samples of skarn contain as (78AMH188). sides. The Sun deposit is Grab samples contain up to 1000 T. 28 N., Cu, Pb, Ag currently active. Numerous and along bright orange-stained 00 ppm W and Zn, and more than prospects on similar deposits fracture zones in the granite near its contact. Selected cated numerous barren white (4.9, 14.5)T. 26 N., Cu R. 22 E. Grab sample of copper-stained have been located by several chlorite schist collected during (77ANS020). T. 22 N., Sn, Zn, Bi Area briefly examined as likely This study mi2 around the Sun deposit. ppm Au, 55 ppm Ag, 0.6% Pb, 0.8% One similar but rusty quartz vein . Origin and extent of minerali-None is known as well as the about 1 m thick contains much , 450 ppm Sn and 300 ppm W, as skarn samples near granite con-Sun deposit, but diamond drilling zation unknown but probably not chalcopyrite, 10 ppm Ag and 200 well as visible fluorite and tact contain up to 200 ppm Bi, and detailed mapping have molybdenite. Mineralization is 1000 ppm Sn, and 2000 ppm Zn. continued in the area every apparently very erratic and of Sphalerite in minor amounts 37 (Nathtuk T. 25 N., Grab sample of copper-stained T. 27 N., Ag, Cu 5 (Kutuk T. 21 N., occurs in quartz veinlets and (78ANS055, Mountain) R. 25 E. orange-weathering dark-gray and sphalerite with Cu and Ag T. 25 N., Ag, Cu, Mo, R. 17 E. Sn, Zn Heterogeneous sequence of folded This study disseminated grains in a provalues intersected in 122-m T. 20 N., Selected grab samples contained marble and hornfelsed shale near (78ADG044). diamond drill hole in carbonates. granite contact is prominently Mineralization is apparently undark-gray limestone that is known; considerable staking in faulted(?) into a sequence of sign of ore minerals. Grab area and limited diamond drilling (1975b). calcareous muscovite phyllite. T. 30 N., R. 25 E. Grab sample of sparse white samples of hornfelsed rocks contain up to 5 ppm Ag, 300 ppm T. 20 N., About 25-50% of the rubble over This study than 1% Zn, 500 ppm Cd, and up Volcanogenic, massive sulfide Unpublished to 2 ppm Ag. Apparently the chert-pebble conglomerate meter consists of large irregular deposit. Minor chalcopyrite contains 2 ppm Ag, 700 ppm masses of botryoidal geothite T. 25 N., Contact of granite with black This study Cu, 150ppm Pb, 20 ppm Sn, and Ab, Be, Bi, that replaces or fills open spaces calcareous phyllite briefly Grab sample of sheared white This study Some mapping and surface sampling by industry in 1970's. muscovite quartzite has minor M Current (1976) placer gold pro- U. S. Bureau Mineralization present but Grab sample of unspecified rock Garland, 7 (Nigikpalugu- T. 27 N., T. 20 N., copper staining and contains duction of a few tens of ounces of Mines sparse to rare. Several rubbly contained as much as 2.5 ppm Au, ruruvak Selected samples contained 2.5 Garland, per year. Source may be pyriteoutcrops of white quartz that 2 ppm Ag, and 810 ppm Cu. Another Trible and ppm Au, 35 ppm Ag, 7250 ppm Cu, 1750 ppm Pb, and 1500 ppm Zn. quartz veins that cut phyllite cut black phyllite contain dis-This study Background rock geochemical T. 24 N., sample of biotite-quartz-feldspar schist contains 5 sequence of dark gray to black Probably a stratiform volcanoselected samples contain 70 ppm greenschist with pervasive iron this study Ag, 100 ppm Bi, 100 ppm Sn, and Background rock geochemical This study T. 25 N., Ag ppm Ba, 30 ppm Mo, and 2000 ppm V. of skarn contain up to 100 ppm Be, 150 ppm Bi, and 2000 ppm Sn. sample of calcareous phyllite Small sample of c:opper-stained This study deposit; weakly dissminated Extent of mineralization unknown; work limited to brief examinations. chalcopyrite and sphalerite in muscovite-quartz schist up during geologic mapping con-Grab samples of black shale and This study A float sample of massive T. 25 N., T. 25 N., Cu, Zn, As Grab sample of unspecified rock Garland, tained 500 ppm Ag, 15,000 ppm Cu, 5000 ppm Pb, 7000 ppm Sb, and iron-stained quartz float colpyrrhotite and chalcopyrite contained up to 2 ppm Au. Extent Trible, lected during geologic mapping found in creek contains 5000 samples contained as much as 0.72% Cu, 2.15% Zn, and 0.40 ppm As, 50 ppm Bi, and 7000 (1975a). Quartz vein that cuts massive Unpublished indications of mineralization. T. 25 N., detailed mapping and surface gray limestone and black phyllite industry Quartz (vein?) float over an T. 25 N., Grab sample of gray limestone This study sampling by industry in 1970's. Grab samples in a 30-m thick has copper values. Prospect T. 23 N., area about 20 m long conlayer of Mn-stained graphitic Area of volcanogenic massive T. 20 · N., similar rock contained 7 ppm Ag. muscovite schist that strikes R. 14 E. sulfide mineralization assocacross ridge contains up to 5 Au and 480 ppm Ag. Mineralizaiated with metarhyolites. Grab sample of pyrite-bearing This study tion probably related to nearby T. 25 N., Silver reported prior to 1913 by Smith (1913). granite pluton. Briefly examined. altered zones in calcareous diamond drill sites in area. Probably stratabound volcanoa prospector. No more recent subsiltstone contains 300 ppm As Both claim staking and diamond genic mineralization similar to stantiation of mineralization in Few ounces of placer gold prothat known to the west. Work drilling in area in 1978. (1913); (4.9, 6.0)T. 25 N., Thin quartz veins that cut This study lens of high-grade silver ore Volcanogenic massive sulfide This study Grab samples of silicified orange-weathering marble and graphite reported during T. 20 N., Cu, Pb, Mo Grab samples from a 30-m-thick This study deposit; malachite staining in granite with disseminated early (probably pre-World War locally have copper staining. bluish-gray biotite-quartz schist layer contain 700 ppm pyrite along fault zone con-(0.6, 1.9)porphyroblastic chlorite-quartz Selected samples contain up to schist. Some mapping and surface 70 ppm Ag, 1% Cu, 1% Sb, and substantiation of mineralization sampling by industry in 1970's. (Also see map no. 59). Briefly examined. Contact metamorphic deposit at granite- (78ANS200). O Grab samples of black siliceous This study O Grab sample of quartzite taken Garland, 27 (Gull Pass) T. 25 N., Ag A number of prospect pits and This study. T. 20 N., Uncertain, Various creeks prospected prior Smith and schist contact. Selected samples phyllite for background con-R. 14 E. several diamond drill sites to 1915; colors and some indicacontain up to 5 ppm Ag, 100 ppm Bi, mapping contains 3 ppm Ag. tain 2 ppm Ag, 50 ppm Mo, and zones in schist. Mineralization production and no modern work, Unlikely that any placer gold Grab samples of small apophyses This study probably similar to or extension P Six or more quartz veins with Schrader Porphyritic, foliated granite This study. Approx. resources remain in view of the 14 (Angiaak T. 24 N., of deposits in map no. 59 to west. 200 ppm Be. Mineralization pro- 77ANS142). is irregularly stained a gaudy exhaustive prospecting for placer malachite, and stibnite dis-Heterogeneous sequence of rocks This study. bably related to intrusion of the covered in 1902-1903. No more recent substantiation of this 76 (Helpmejack Vicinity genic massive sulfide deposits in the granite to a coarse-grained Dolomitic marble locally cut by This study to west and east. Rocks commonly Cu, Ag, Sn a network of quartz veins with view of the exhaustive gold pro-O Grab samples of marble, dolomite, Garland, 29 (Gull Pass) T. 25 N., Au, Ag, Cu tion of pyrite. Grab samples rarely pits and recent claim staking. specting in central Alaska since chalcopyrite and arsenopyrite; quartzite, and diabase contain as Eakins, much as 10 ppm Au, 3 ppm Ag, and Trible give anomalous values, but extended then, highly unlikely that any search can usually identify a few T. 20 N., R. 16 E. significant placer gold remains. Pb, Ag Irregular quartz veins or segre- Garland, and 170 ppm Cu. Briefly examined. (1975a). gations over an area at least arsenopyrite along fractures in Sparse float of vein or segrega- This study Brief examination of about 300 the altered granite. T. 24 N., Cu, Sn, W, tion quartz in foliated, porin medium grade metamorphic rocks McClintock m of well-exposed contact
of granite with medium-grade phyritic granite contain 5000 contain irregular masses of galena and sphalerite. Analyses this study ppm As, 30 ppm Bi, and 200 ppm of massive galena indicate 1000 silicate rocks that overlie an orange-weathering altered granite contained visible galena and 7 high-grade but erratically disstaked about 1976 and probably tributed ore minerals with currently active; work apparently limited to surface trenching. Mineralization may be related to small granite pluton nearby. contain up to 200 ppm Ag, 1000 ppm Bi and W, and more than 1000 ppm Sn. MINERAL DEPOSIT MAP OF THE SURVEY PASS QUADRANGLE, BROOKS RANGE, ALASKA

ADGGS Minerals Libro FOLIO OF THE SURVEY PASS QUADRANGLE, ALASKA

MISCELLANEOUS FIELD STUDIES MAP MF-1176-F